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URGES UTILIZATION OF SMALL MARINE ANIMALS

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When bottom nets are used for fishing in Primorskiy Kray, South Sakhalin, and the Kuriles waters, occasionally, huge quantities of marine animals such as crayfish, sea urchins, starfish, sea cucumbers (cucumaria), trepang, sea squirts (ascidians), and others are caught in the nets. Often there are more of these marine animals than fish, and much labor has to be spent dumping them back into the sea.

Experience has shown that most of the marine animals caught with the fish can be valuable as raw material for making industrial products. Starfish and sea urchins can be used for preparing mineral food or fertilizer, and sea cucumbers for albuminous food products and nitrous fertilizer. Their chemical composition is as follows (in percent):

	Moisture	Fat	Albumen	Over-all mineral Content	C_2	Ph_2
Starfish	74	1.9	14.3	9.8	0.40	0.12
Sea urchins (whole)	36.8-44.5	0.10-0.12	2.8-3.3	48.9-50.3	50.2	2.6
Sea urchin roe	45.7	31.5-34.9	20.3-19.2	2.5-2.6	--	--

The holothurians (trepang and sea cucumbers), along with being prepared as export products, can also be used as raw material for making feed meal and fertilizers. Since the sea cucumber contains a considerable amount of water in its cavity, the weight of the solid shell, which may be ground into meal, does not increase the weight of raw material by more than 50 percent. In preparing meal from sea cucumbers, nearly 94 percent of the raw material weight is lost. Of this, 54 percent is due to the removal of water from the cavity and 34 percent to water evaporation.

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Meal from the holothurians is a brownish color and has a very slight odor. It is composed of the following substances: 5.4 percent moisture, 61 percent albumen, 2 percent fat, 18.1 percent ash, 13.5 percent carbohydrates, 3.7 percent calcium, and 2.6 percent phosphorus. Results of experiments show that sea cucumbers are valuable raw material for making feed meal.

Starfish tissues contain a large amount of minerals. When preparing starfish for fertilizer by boiling, drying, and pounding, in boiling 96.6 percent of the raw material is utilized, and in drying, 37 percent. Boiled starfish dry easily in the sun and after being pounded make a greyish flour containing: 4 percent moisture, 28.7 percent albumen, 2.3 percent fat, 58.9 percent ash, 33.9 percent calcium, 0.2 percent phosphorous, and 4 percent silicic acid. This fertilizer can be used for sour soil and as feed meal for poultry.

Sea urchin shells contain many minerals; consequently, the dried product obtained from them contains 82-84 percent mineral substances. Sea urchins are prepared for fertilizer by drying boiled sea urchins in the sun or in driers. Fertilizer can also be prepared by drying raw sea urchins. In drying raw urchins, 32-35 percent dried produce is utilized, and in drying boiled urchins, from 15 to 20 percent. Fertilizer from sea urchins is light grey and almost odorless, and is composed of the following substances: 0.5-1.2 percent moisture, 0.6-1.9 percent fat, 3.7-11.9 percent albumen, 82-84 percent ash, 1.4-3.5 percent phosphorus, 29-35 percent calcium, and 7-8 percent undiluted substances.

Sea urchin roe is bright orange in color. Raw roe contains 32 percent fat and is prized by Eastern USSR markets as a food product.

Sea squirts (ascidians) usually are caught fastened to the rocks on which they live and are cut off with a heavy knife. Body tissues contain much water which is let out by cleaving the shell in half. When this is done, the weight of the animal is decreased by 40-50 percent. The final product is 9-12 percent of the raw material. After being pounded, the shells produce a red feed meal, containing 35-55 percent albumen, 0.5-1.5 percent fat, and 9-17 percent ash.

Sponges and bryozoa are also found in fairly large quantities in the nets. Dried bryozoa form a light cream-colored mass; the output of dried material is 20-22 percent of the raw material or 35-38 percent of the strained material. Dried bryozoa contain 61-63 percent ash most of which is composed of silicic acid combinations. Neither sea squirts nor bryozoa, however, have any real value as raw material for preparing industrial products.

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